

Environmental Education and Sustainability in California Public Schools

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Introduction

Environmental education and sustainability practices in schools have been emerging as an important trend in 21st century education, and a growing body of research and practice indicates that green schools can save money, improve health, and boost academic achievement. In September 2014 Inverness Associates conducted a comprehensive survey of environmental education and sustainability among California public schools. The survey sought an understanding of how schools' environmental educational programs develop environmental literacy among students—the environmental knowledge, skills, attitudes and behaviors they need to become informed citizens, critical thinkers, and environmental stewards. The survey also examined the broader issue of how schools are becoming more environmentally sustainable in terms of efficient facilities, healthy operations, and an ecological curriculum. The results provide a detailed portrait of the successes and challenges experienced by California public schools as they incorporate environmental education and sustainability practices. And they point the way for how to strengthen this vital area in our schools.

The survey results provide one of the first green school baseline evaluations for California. Surveys were sent to 7,703 traditional and charter public school principals. With 520 school principals participating, a 7% response rate, the returns are statistically significant, with a 5% margin of error and a 95% level of confidence, allowing for valid generalizations about the views of principals regarding environmental education and sustainability. Analysis of the data indicates the survey was generally representative of the state's public schools in terms of the type of school (traditional, charter), grade level structure, and enrollment size. The survey may overweight to some degree schools in very large districts and schools where the principal is engaged with environmental education and sustainability issues. There was more limited participation of principals from some rural counties and from financially disadvantaged schools (80-100% Free and Reduced Meals), and so the responses underrepresent these types of schools.

SCHOOL LEADERSHIP

Gateway High School principal Sharon Olken and Environmental Science Teacher Will Parish help lead the sustainability initiatives at their school, including a solar powered "snack shack" designed and built by students; Will Parish has since become the executive director of Ten Strands, a non-profit focused on expanding the use of the Education and the Environment Initiative (EEI) in California schools.



Central Findings and Conclusions

The California survey demonstrates that there is significant engagement with environmental education (EE) and sustainability in our public schools. In all areas of operation—overall organization, efficient use of resources, healthy operations, environmental curriculum, food and nutrition, and student leadership--the survey shows that many public schools are working to make environmental sustainability a priority. Yet, the survey also reveals that public schools need to adopt a more systematic and systemic approach to environmental education and sustainability.

Interest in EE and sustainability is strongest among administrators, faculty and students, who are motivated by their concern for the environment. Many schools are organizing around a facilities master plan, green team, and green policies. Over a quarter of all schools report having a sustainability coordinator or lead green teacher, who is supported by faculty and parent volunteers. Financial support for EE and sustainability is modest with more than three-quarters of the schools spending less than \$5,000 per year on non-construction activities. A majority of schools are working to lower their environmental impact through waste reduction, recycling, composting, energy efficiency, and many have installed ecological schoolyard landscapes. A large number of schools have gardens and are improving their nutritional food offerings. Relatively few schools are incorporating green building practices in new construction and renovation. The integration of EE in the curriculum is beginning but is not well developed. The data show that financial, personnel and curricular resources available for EE and sustainability are not equitably distributed, making it more difficult for financially disadvantaged schools and districts to become greener. Nonetheless, the data also show that interest in environmental education and sustainability is strong among schools in all communities regardless of financial circumstances.

The survey points to key challenges that must be addressed to make further progress. Principals would like more money, time, and staff; better organization and designated leadership; greater commitment from the school board and district, an overall sustainability plan for their schools, and outside support; as well as more buy-in, enhanced staff training, and more integration of environmental education into the academic curriculum at their schools.



SAN FRANCISCO'S DISTRICT LEADERSHIP

San Francisco Unified School District has demonstrated that dedicated leadership, staffing and resources can effect systemic change. Director of Sustainability Nik Kaestner has documented significant savings, while the district's first Ecoliteracy Content Specialist Sarah Dulaney helped coordinate curricular efforts and is shown here with a Green School Corpsmember Eva Stevens at Bret Harte Elementary School.

The following comments from principals illustrate the overall benefits and success factors, as well as the challenges and needs, among schools going green.



BENEFITS AND SUCCESS

"The most essential benefit is educating all members of our school and community about the importance of environmental practices that sustain life."

"The students LOVE taking charge of recycling, and their project based learning on reducing our footprint is the impetus for change."

"The staff and students have a much greater awareness of how we can save our environment and money by being good stewards of energy production and efficiency."

"Reducing energy costs frees up money to apply toward educating the children; minimizing the continued maintenance by having less grass, watering less, planting native species frees up personnel time to fix other facility issues."

"Reduced carbon footprint, reduced energy bills due to solar installation, community recognition for green efforts."

"Our school philosophy and mission includes 'compassion,' and we approach environmental sustainability as a means of showing compassion for our planet."

"The decrease in usage of hazardous materials in our school grounds has increased a healthier, safer environment for our staff and students."

"Our green schoolyard provides space for our outdoor science curriculum."

BENEFITS OF ENVIRONMENTAL EDUCATION

"Children gain lifelong knowledge when they are able to touch, feel, explore the world around them; it helps to make the curriculum come to life."

"It is so special to see our children excited about outdoor education, learning about the environment, and developing lifelong strategies for healthy living."

"Informal environmental education helps convey the real world application of what students learn at school."

"When our underserved students get outside of their neighborhood and see what the world has to offer it inspires them to want to take good care of the planet."

"Environmental awareness, empowerment to make a difference, knowledge about ecological systems and environmental issues, ability to act to make positive decisions about the environment, ability to teach others and be stewards of the environment."

CHALLENGES AND NEEDS

"Time, Money, Support."

"I don't think we have a sustainability plan, so that would be the first place to start."

"No time, no 'champion' to head it up, no directives from on high."

"Curriculum resources are not aligned to NGSS standards."

"Finding time to incorporate environmental resources with the standards-based Common Core and NCLB requirements makes scheduling difficult."

"Lack of training opportunities/PD."

"Someone to lead the charge."

"More organized integration of sustainability across the curriculum."

"Curricular materials that can be incorporated, not an add on."

"PD to allow teachers to understand how these goals support CCSS."

"District vision and mission that includes sustainability."

"A plan backed by state/district priorities to create time to do it."

INFORMAL EE PARTNERS

Environmental education in schools is enhanced by a great network of informal EE partners that include institutions like the Chabot Space and Science Center, where executive director Alex Zwissler is leading the effort to build a new Environmental Center, and the Monterey Bay Aquarium (above), which provides students first hand experience in marine science.



Detailed Findings

This section reports key findings about the state of environmental education and sustainability in California's public schools as viewed by the principals. (Charts of the results can be found in the appendix at the end of the report.)

SCHOOL ORGANIZATION FOR ENVIRONMENTAL SUSTAINABILITY

Schools that have experienced the most success going green share key characteristics. Typically, they have an organized group responsible for developing and monitoring goals and objectives, designated leadership, an environmental sustainability mission statement, and adequate financial support.

Interest level in environmental sustainability is clearly highest among administrators (66% identified as extremely/very interested), then faculty and students (46% each), while non-faculty staff, board and parents are less interested (40%, 37%, 35%); less than an eighth (12%) of these groups have little or no interest.

Concern for the environment motivates sustainability efforts (66%), which are led by engaged faculty and students (59%) and principals (57%), who are clearly engaged with the issue; parents and the PTA (40%), desire to save money (31%), the

superintendent (24%), the school board (20%), and state or county policies (10%) were less significant factors.

Schools organize their green efforts through a facilities master plan or modernization plan (44%), a green council or green team (39%), and a set of policies to promote environmental education and sustainability (33%).

In many schools a small (2-5) group of staff (62%) and parent volunteers (44%) works on sustainability issues and to support motivated students.

About a quarter of schools report sustainability efforts are led by a sustainability coordinator (27%), but only a small percent have a compensated leader (9%).

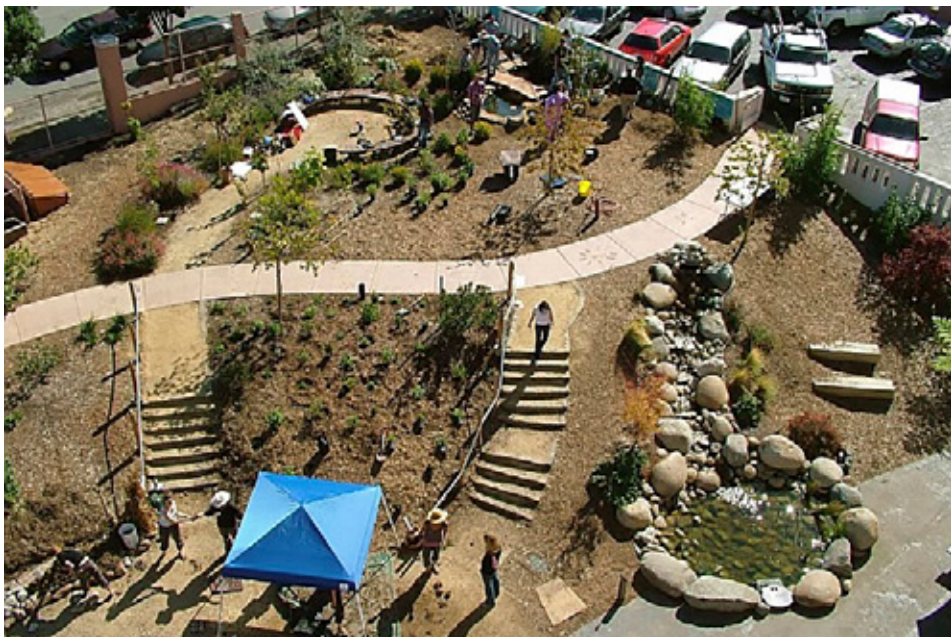
Only a quarter of principals report that environmental education and sustainability is reflected in the school's mission and priorities to a very great/great extent (24%).

Financial support for environmental education over and above capital expenditures—for field trips, outdoor education, assembly speakers,

curricular materials, and professional development—is modest, typically under \$5,000 (77%); some schools are allocating significant funds, greater than \$10,000 (13%).

Few schools have been recognized for their sustainability efforts (15%) through LEED, Green Ribbon or other awards such as state or green business certification, Energy Star Schools, or the Green Cup Challenge.

For schools with 80% or more Free and Reduced Meals, principals' views on school organization, and the other survey categories that follow, were below the statewide average by 5% or more for about one-fifth of the questions and illustrate the challenges they face, with less support from PTAs and parents, fewer green school buildings and grounds improvements, and less integration into curriculum.



GREEN SCHOOLYARDS

Many green schools have gardens, like the one created by kindergarten teacher Emily Blossom at New Highland Academy, and often schools incorporate the garden in the curriculum. The Sherman Elementary School campus (left) has been transformed into a green schoolyard, and many urban schools practice water conservation and raised bed gardening.

REDUCING THE SCHOOL'S ENVIRONMENTAL FOOTPRINT

Reducing environmental impact is clearly a top priority in a large number of schools, however, it is apparent that schools still need to adopt a more systematic effort to measure, monitor and report to the community on resource use. Many schools need to incorporate basic green policies in their operations. To achieve maximum efficiency, schools need to incorporate green building standards and renewable energy options.

Waste reduction, recycling and/or composting programs are widespread (75%).

Numerous schools are pursuing energy efficiency initiatives (65%).

Some schools are working to adopt a sustainable approach to landscaping and water use (44%), reduce the use of hazardous chemicals (31%), and install ecological schoolyard landscapes (23%).

Remarkably, nearly a quarter of schools (23%) have installed renewable energy (solar, wind, geothermal).

Green building practices, including LEED/CHPS-certified renovation and modernization (12%) and construction (8%), have not been widely embraced.

Few schools have a green purchasing policy (7%).

Funding for green facilities and operations initiatives has come principally from the district (60%), school budget (37%), grants (29%), and PTAs (20%).

RENEWABLE ENERGY

Support by Proposition 1D in 2006 and Proposition 39 in 2012, Californians have made a significant investment in bringing renewable energy to K-12 schools, an effort guided in many districts by solar master plans.



FOOD AND NUTRITION PROGRAMS

The school garden movement has clearly engaged many public schools. To maximize the impact, all schools need to provide garden teachers and integrate the garden in the curriculum. Properly positioned, the school's food program can help promote good nutrition, an understanding of where our food comes from, and hands-on experience with the environment for students.

Three-fifths of schools have a wellness policy (60%) that guides the development of food and nutrition programs.

Sustainability efforts in a large number of schools feature a garden (68%), and some schools link the garden to the curriculum (43%) and serve garden produce in the cafeteria (26%).

A third of schools offer a cooking class to teach students about food and nutrition (34%).

Less than a fifth of schools offer a nutritional food program with local and/or organic food (18%), and only a few schools have a farm to school program (10%).

ENVIRONMENTAL EDUCATION EE IN THE CURRICULUM

While environmental activities in facilities and operations seem to be relatively widespread, EE has yet to move into the curricular mainstream. The most successful schools have

defined environmental literacy, used it to evaluate and revise the curriculum, and provided support and professional development for the faculty to integrate environmental education in the academic program.

Few principals indicate their school has been successful in integrating environmental education in the curriculum (Extremely/Very Successful 13%; Not Very/Not At All Successful 43%).

For many schools, principals report that a student environmental club is the place where environmental education is taught (38%), suggesting that EE is not yet in the curricular mainstream.

Schools report the integration of environmental and sustainability concepts across the curriculum (34%), in an elective class (17%), or in an AP Environmental Science course (14%) in high schools.

Environmental education is offered most often in the context of STEM classes (63%) and to a much lesser degree in the humanities and social sciences (26%).

Outside the classroom, schools report a relatively broad-based approach to environmental education, including the school garden (49%), outdoor learning experiences (44%), using the campus as a hands-on learning laboratory (41%), service learning projects (33%), and civic engagement projects with environmental themes (28%).

To a great extent school-based environmental education utilizes teacher-created curricula (74%), which likely explains the principals' call for more professional development.

For curricular programs developed by outside specialists, FOSS science units are used most often (46%), followed by the Education and the Environment Initiative (13%).

School principals indicate there is very little professional development in environmental and sustainability education. (To a small extent/Not at all 74%).

Few schools have a written definition of environmental literacy (5%), an environmental literacy requirement (4%), or a means of assessing environmental literacy (7%).

INFORMAL ENVIRONMENTAL EDUCATION AND THE CONNECTION TO SCHOOLS

Principals understand that providing opportunities for their students to experience nature is vital to their development as environmental stewards. Effective schools offer a variety of field trips and outdoor education programs and the resources to support them. There needs to be a stronger connection between informal environmental organizations and schools to benefit students and to provide faculty opportunities for professional growth and environmental curriculum development.

A large number of principals believe informal environmental education is extremely or very important in helping students achieve environmental literacy (60%).

Virtually all schools report using a variety of field trip experiences—outdoor programs, science museums, zoos, aquariums, parks and farms—to promote environmental education (94 to 99%).

About a third of schools report using outdoor programs and science museums to develop curriculum (39%) and about a quarter report using zoos, parks and farms for curriculum development (29%).

Environmental organizations that are occasionally used for teacher professional development include outdoor programs (16%), science museums (13%), and zoos (11%).

Schools also report using a wide variety of other informal environmental providers and identified several hundred such organizations, most within a reasonable distance from campus.

GREEN PARTNERSHIPS

The effort to incorporate environmental education and sustainability in California's K-12 schools has been supported by organizations like the Green Schools Initiative, whose executive director Deborah Moore (second from left) is shown here with students before a successful presentation to their school board about recycling.

CHALLENGES AND NEEDS

As the survey findings and comments from principals indicate, the effort to green schools faces challenges from competing priorities, lack of resources, a need for strong leadership and a sense of urgency.

Teacher workload (78%), lack of funding (74%), and schedule/time constraints (69%) top the list of challenges to enhancing environmental education and sustainability programs.

Principals also cite personnel issues—lack of training (49%), inadequate staffing (43%), insufficient buy-in (35%)—as hampering their effort to advance environmental education and sustainability.

The main challenges to using informal EE specifically in schools are a lack of time, schedule constraints that make field trips difficult, limited funds, and transportation issues.

To address the challenges incorporating EE and sustainability, principals would like increased funding, more time, more staff, designated leadership, and a sustainability plan for their schools.

In addition they would like more buy-in, better organization, more staff training, more integration of environmental education into the curriculum, and outside support.

CONCLUSIONS

The survey of environmental education and sustainability in California public schools reveals there is a range of engagement with these issues, with facilities and operations most salient. An awareness of the widespread environmental challenges we face has motivated many principals and their school communities to make an effort to become greener. In all areas of operation—overall organization, efficient use of resources, healthy operations, environmental curriculum, food and nutrition, and community practices—the survey reveals that public schools have begun to incorporate initiatives focused on environmental sustainability. The survey also reveals that our schools face challenges in making environmental sustainability a priority, getting organized, providing leadership, funding initiatives, and finding time and resources to devote to the effort. While principals outline a long list of needs, at the same time they identify opportunities for California public schools to strengthen their commitment to environmental education and sustainability.



Recommendations

These recommendations for how to develop green, sustainable school initiatives are focused on individual schools, working with school districts and informal environmental education organizations.

1. PARTNERSHIPS

Use the resources of the California Department of Education to participate in the California Green Ribbon Schools program, CREEC (The California Regional Environmental Education Community), and the Blueprint for Environmental Literacy, to be released in June 2015.

2. ORGANIZATION

Make EE and sustainability a high priority, establish a Green Council, craft a green mission, goals, a plan, and report progress on a regular basis.

3. LEADERSHIP

Appoint a compensated Sustainability Coordinator responsible for developing and directing the school's and/or district's overall sustainability plan.

4. RESOURCE EFFICIENCY

Benchmark and monitor use of electricity, oil/natural gas, water, and waste disposal and make systematic plans to reduce usage and document savings.

5. FACILITIES

Encourage school districts to use best practices to renovate or construct buildings that conform to green standards and install renewable power, utilizing the significant monies from Prop 39.

6. HEALTHY OPERATIONS

Adopt policies for green purchasing, hazardous waste and pest management, and school wellness.

7. NUTRITIOUS FOOD

Evaluate and improve the school's food program to focus on good nutrition and health and local, seasonal offerings.

8. CURRICULUM

Adopt a definition of environmental literacy and use it to incorporate EE across the academic program with materials like the California Education and the Environment Initiative (EEI), while providing needed professional development.

9. EXTRA-CURRICULAR PROGRAMS

Enhance opportunities for students to learn about the environment outside the classroom and in nature, strengthening ties to the informal EE community.

10. STUDENTS

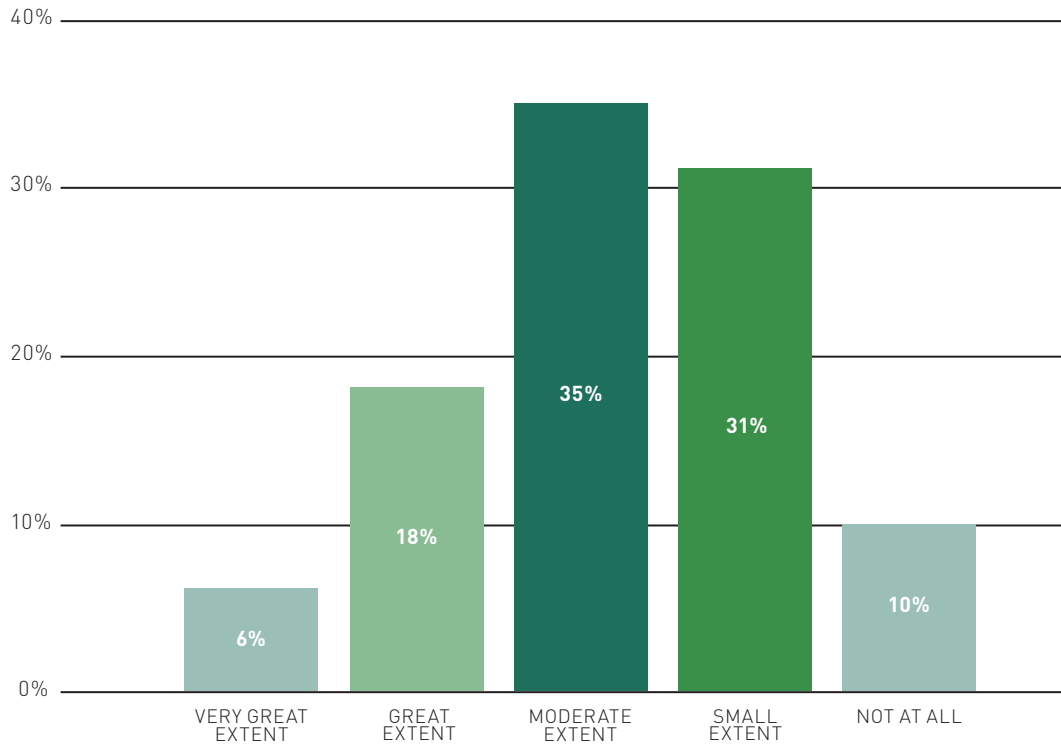
Include students in meaningful leadership roles in making the school more environmentally sustainable.

Looking Forward

The results of the California green public schools survey are encouraging, but we need a greater sense of urgency to address the enormous challenges we face. Making environmental sustainability a top priority in our schools requires taking the long view, one focused on where our state and its schools need to be in 2050 to address mounting environmental challenges. We have the means and the imagination to face these challenges and to help ensure that our students will grow into a world of promise and opportunity where the quality of their lives will be at least as good as that we enjoy today. By becoming more green, and environmentally sustainable, our public schools in California will be doing their part to help raise the next generation of environmental stewards.

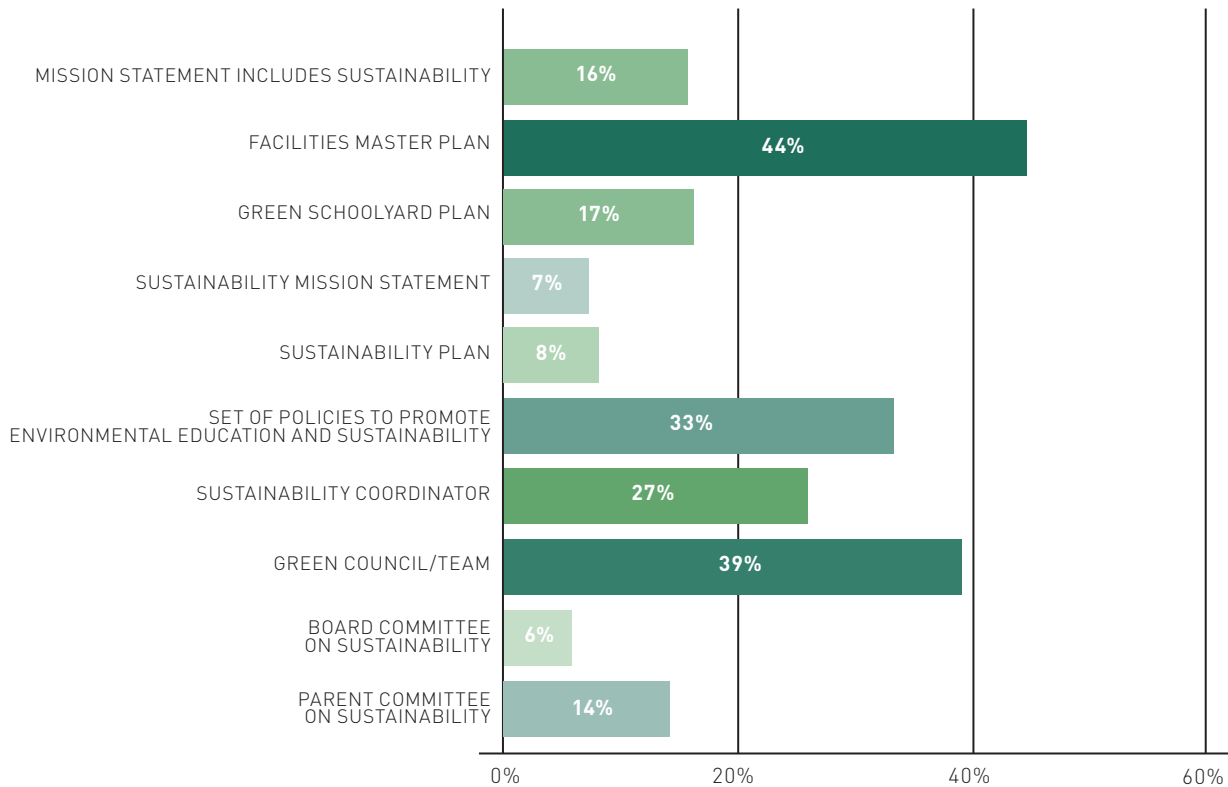
GREEN SCHOOL/DISTRICT MISSION AND POLICIES

Please rate to what extent environmental education and sustainability is reflected in your school's mission and priorities.



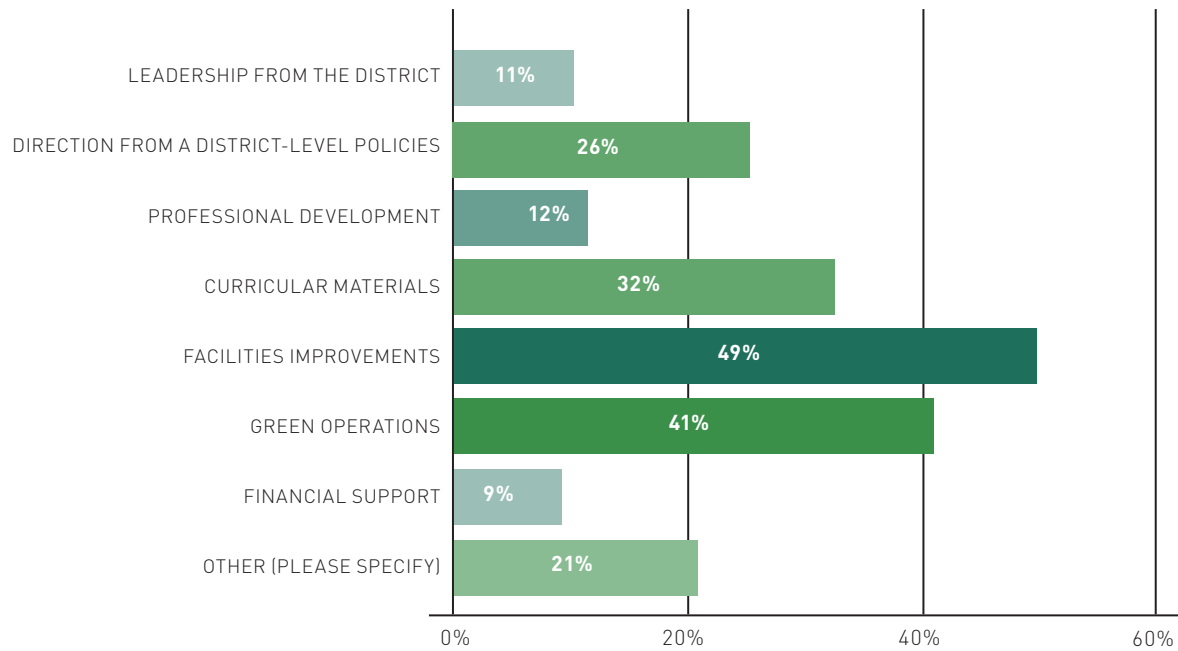
GREEN SCHOOL/DISTRICT ORGANIZATION

Which of the following initiatives does your school have in place?



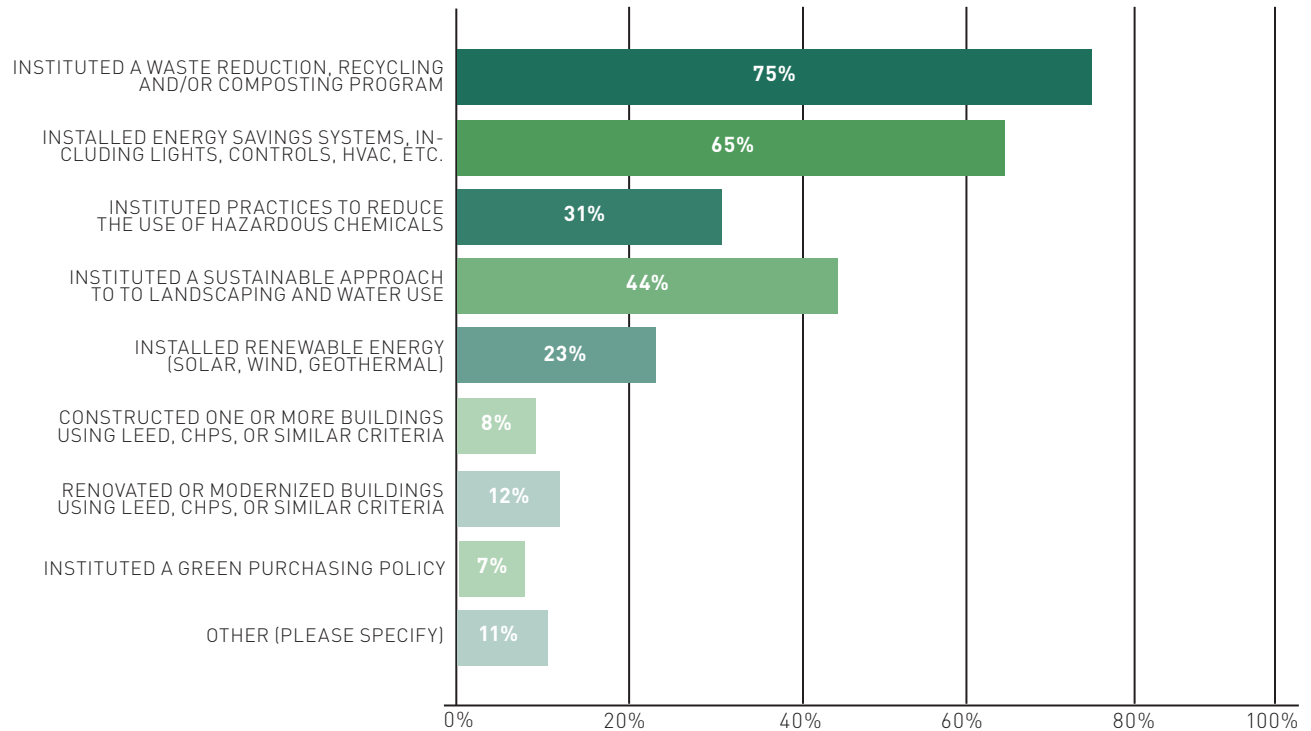
DISTRICT SUPPORT FOR EE AND SUSTAINABILITY

Which factors have contributed the most to supporting and promoting environmental education and sustainability efforts at your school?



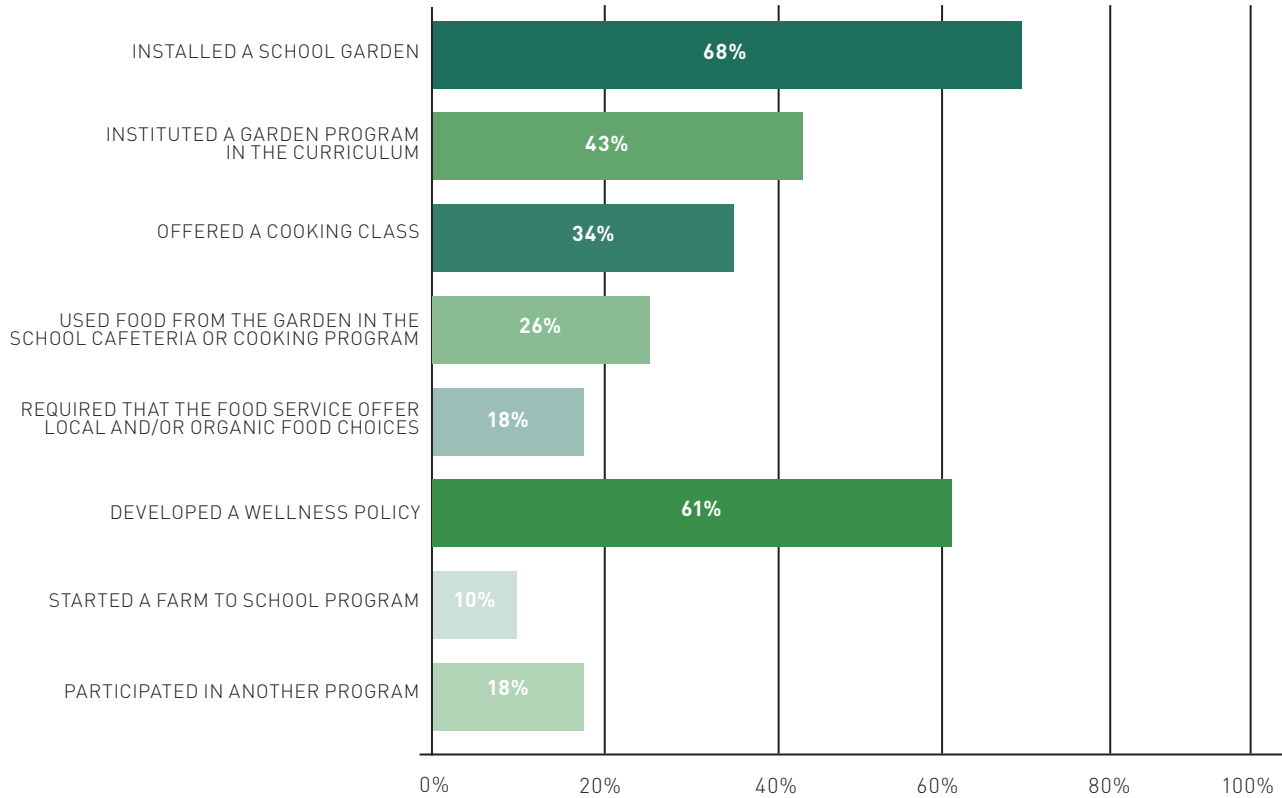
FACILITIES AND OPERATIONS INITIATIVES

Which of the following has your school initiated?



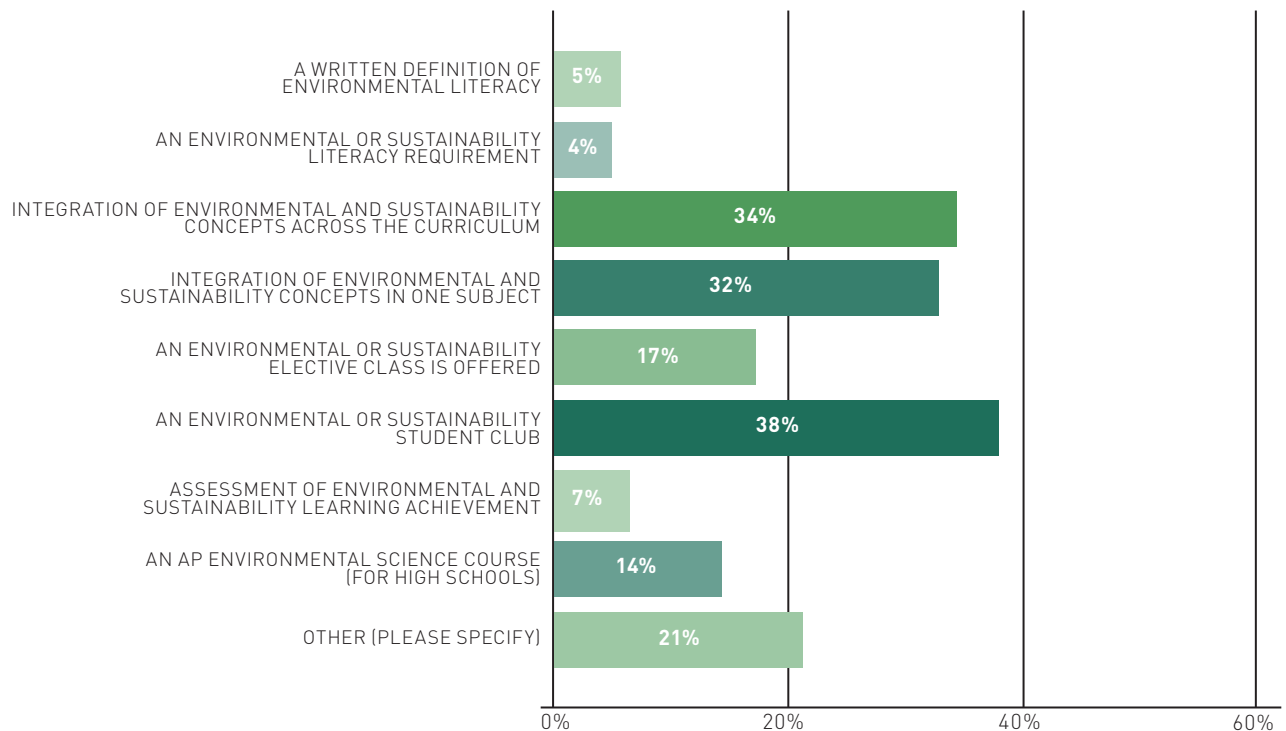
FOOD AND NUTRITION INITIATIVES

If your school has taken any of the following steps, please check all that apply.



ENVIRONMENTAL EDUCATION CURRICULAR PROGRAM ELEMENTS

Which practices does your school employ to incorporate environmental and sustainability education in the curriculum?





ENVIRONMENTAL STEWARDS

California's environmental literacy efforts aim to inspire environmental stewardship. At schools across the state, students are engaged in service projects improving the campus, recycling at their own school, and working for a better future, as the sign at Environmental Charter High School declares.



GREEN TEAM IN ACTION

Principal Paul Chapman is shown here (back row, center) with members of his school's Green Team, who he credits with the successful effort to improve energy efficiency, healthy operations, nutritious food, and an ecological curriculum.



Paul Chapman is Executive Director of Inverness Associates, a consulting group focused on growing greener schools (www.invernessassociates.org). He served as Head of School at Head-Royce School in Oakland, California for 26 years, and before that taught in public and private schools. He is the author of *Greening America's Schools* and *Greening America's Schools 2.0* (2012, 2013), available at www.nais.org. This report is one in a series of surveys of environmental education and sustainability in public and private-independent schools in California and across the country. Deborah Moore of the Green Schools Initiative provided helpful assistance on the survey design and administration, and Nina Zurier was responsible for the report's appealing layout and design.

COVER IMAGE: The Rosa Parks Elementary School campus has been transformed by the work of landscape architect Sharon Danks, whose book *Asphalt to Ecosystems* has helped spark the green schoolyard movement.

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